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New governance approaches for sustainable project delivery

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Abstract

Studies show that many infrastructure projects have problems to deliver sustainability commitments made earlier in the planning process. One problem is that many decisions influencing project design and environmental performance are made after the (formal) planning process and consent decision. Also, many parties are involved in project delivery and there is lack of information transfer (follow-up) from planning stages to construction and implementation. In addition, the effectiveness of project studies has been questioned (i.e. do project studies delivering their outcomes?). In international practice various approaches are adopted to overcome these problems. One approach is to move towards more collaborative relationships between various parties (governmental, private and public). Also, authorities and companies increasingly use procurement and contracting as an environmental policy instrument to further the environmental performance of projects (green procurement). Furthermore, new tools for securing sustainability commitments are increasingly used in infrastructure design and construction (e.g. rating tools such as CEEQUAL, BREEAM, LEED). The various approaches have developed independently but nevertheless seem to head in the same direction – i.e. achieving more environmental sustainable outcomes of (infrastructure) projects. An important challenge is how these approaches can be combined to reinforce each other for more sustainable project delivery. Various relationships can be developed between the different 'tracks' of impact assessment, green procurement and partnering contracts in order to come to a more integrated approach. This paper aims at discussing and comparing different approaches for delivering sustainability in infrastructure projects. By integrating green procurement, partnering and sustainability declaration, an integrated approach could be developed in order to safeguard sustainable performance beyond the formal decision-making phase of infrastructure projects. This integrated approach would enable transfer of information, communication, learning from experience and adaptive environmental management.

Keywords:infrastructure planning; governance; sustainable project delivery; public private partnerships; procurement; impact assessment.

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1. Introduction – An increasing demand for delivery of sustainable development

Society is increasingly demanding that infrastructure planning and implementation should not only be carried out according to regulations but also should further the environment by delivering sustainable development. This demand is verbalised through both EU regulations and the adaptation of new sustainability schemes by market parties.

Traditionally, the planning, design, construction and maintenance of road infrastructure have been undertaken as separate activities by separate organisations from both market and government as illustrated in figure 1 (see for a discussion Arts et al., 2007). The main tool that is used for integration of environmental issues and mitigation of impacts on the environment is Environmental Impact Assessment (EIA). This instrument started its remarkable spread in the USA already in 1970, is now used in more than 120 countries as well as by organisations worldwide such as the WorldBank and inspired the development of many other types of impact assessment amongst which Strategic Environmental Assessment (SEA) for plans and programmes. The EU Directive on EIA has been introduced in 1985 (85/337/EEC) and as a consequence many countries have used EIA as an environmental planning tool for some 20-30 years by now (see e.g. Sadler, 2004; Wood, 2003).

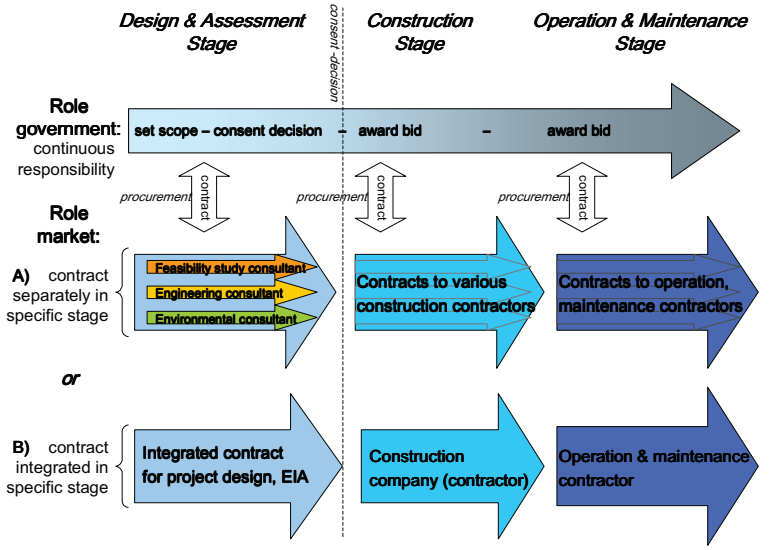

Fig. 1. Traditional approaches to infrastructure planning (Arts, Faith-Ell & Chisholm, 2008).

In the traditional approach to infrastructure planning, EIA is mainly used during the initial planning stages. After consent decision, this approach is heavily relying on follow-up of commitments made in EIA in the planning stage, during the construction, operation, and maintenance stages (see e.g. Morrison-Saunders & Arts, 2004). The most common role of EIA, in this approach, is to minimise and mitigate environmental impacts of infrastructure projects. However, it can be argued that EIA alone does not seem to deliver sustainable outcomes (see figure 2). Some reasons for that can be mentioned are (Arts & Faith-Ell, 2010; Varnäs et al., 2009a; Faith-Ell, 2005):

a. *Not linking explicitly the information of EIA and the requirements of contracts*. All too often contract requirements are not related to EIA, although the latter formed the basis of the consent decision. Environmental requirements in contracts are usually primarily based on a standard set of requirements for the type sector / project and requirements resulting from formal environmental regulations. There is

'room for improvement' to enhance the context-specificity of contract requirements by including issues brought forward in the EIA report and process. Vice versa, in EIA studies little attention is given to the standard set of environmental requirements used in contracting;

b. *Many decisions* that influence the design and environmental performance of the project are made after the EIA process has been completed and the formal decision about project consent has been given;
c. *A lack of transfer of information* (follow-up) in the life-cycle from the planning stage to the construction and implementation because of the gap that exists between the various stages of planning (project development and decision-making vs. project implementation;
d. EIA *focuses all too often on acceptable impacts* instead of optimising the project for environmental, social and community benefit. The added value to the design and implementation of the project is usually limited. This because EIA regulations usually only require that minimum standards are met;
e. There is *little scope in taking on other mitigation approaches* during the EIA process that are traditionally used by government. Apart from EIA, government uses traditionally instruments such as: environmental monitoring, environmental permitting, classic contracting, and auditing (see figure 3).

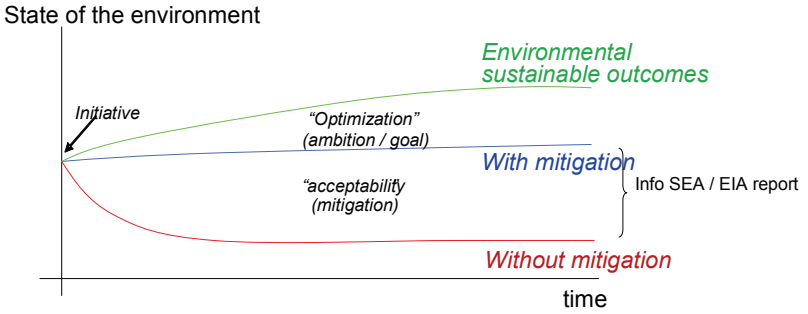

Fig. 2.The delivery of Environment from SEA/EIA (Arts & Faith-Ell, 2010).

Much happens after impact assessment when proponents (government or private companies) implement the proposed development and contract work, goods or services. This is the stage when other parties – often private parties such as (sub) contractors – become involved in project implementation, and most actual impacts on environment, economy and the social community occur. These implementation parties may not have insight in the planning process, and similarly, planning practitioners may have limited insight in the role of implementation agencies and therefore suggest unpractical mitigation.

Moreover, there seems important changes in the classic role division between government (overseeing), market (executing) and public (looking from aside) which might be called a change "from government to governance"(Faith-Ell & Arts 2011). Related to this also changes can be seen in the instruments used in project development and implementation – from EIA, permitting, classic contracting, monitoring and auditing to new instruments (see figure 3, discussion in next section).

In order to deliver sustainability, a more inclusive, dynamic approach – than the classic approach discussed above may provide – is needed. This, to allow for more exchange of knowledge, ideas, learning, experimenting and optimising which might enhance the adaptiveness required to deal with complexity of current society. To this end EIA has to be coordinated with other tools and partnerships have to be established between the various parties involved. As will be shown in the next chapter, there are several new approaches that are currently under development that could link-up with EIA. This paper aims at exploring and comparing different approaches for delivering sustainability in infrastructure projects.

2. New approaches to project implementation are emerging

In recent practice of (transport) infrastructure developments various relevant trends can be distinguished (see figure 3):

- *Life cycle integration* – linking better the various stages in the planning process: strategic plan-making, project study and decision-making, construction, operation and management – e.g. life-cycle management/costing, supply chain management;
- *Earlier involvement of market parties* such as contractor, banks, that were usually only involved in the implementation stages – e.g. green procurement, innovative contracting (Design & Construct, Design-Build-Finance-Maintain etc.);
- *Self-responsibility* of private companies – e.g. social corporate responsibility, environmental management systems;
- *Broader scope* – e.g. an inclusive scope relating to people, planet, profit which can be seen in rating or labelling instruments used in industry like CEEQUAL, LEED, BREEAM;
- *Involvement of third parties*, especially civil society – e.g. social license to operate.

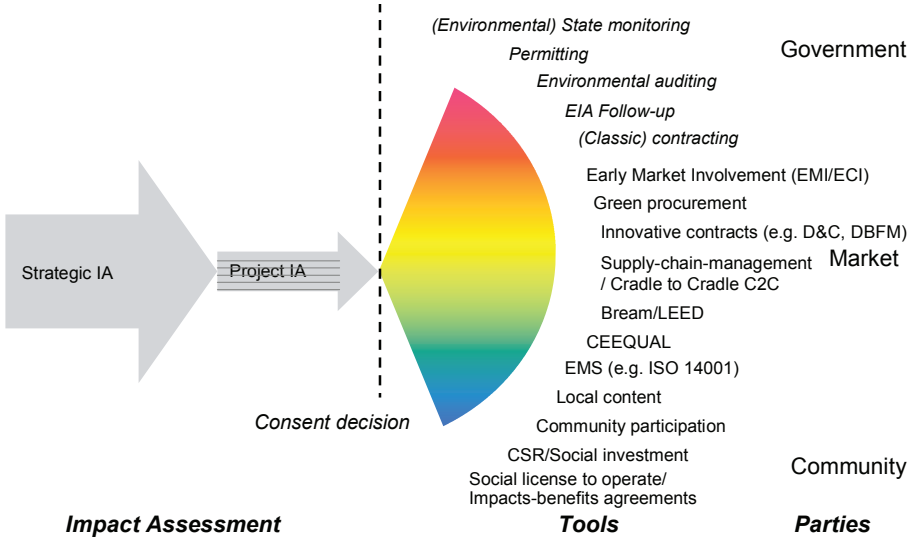

Fig. 3. Overview of various approaches (tools, concepts) used in infrastructure planning after the consent decision, parties involved and main governance strategies (after Faith-Ell & Arts, 2011).
NB: The approaches that are used traditionally in infrastructure planning are indicated in italics.

These trends are partly driven by the sustainability needs and ambitions, or at least might potentially fit well to sustainability ambitions. Because of these trends also new governance approaches emerge. Governments, agencies, companies and communities are changing the way they interact in project development and are moving towards new forms of governance involving partnerships – either public-public or public-private partnerships (Ngowi, 2007; Bresnen & Marshall, 2000; Arts et al., 2010). Overall, there might be distinguished three major governance strategies (see also Robinson et al. 2000):

- Coordination – hierarchic, directive steering (EIA, permitting);
- Cooperation – network steering (partnering);
- Competition – market steering (tendering, buying, selling).

In sectors such as infrastructure – but also energy, mining etc. – many new types of instruments have been developed assuming various governance strategies, especially in the stages after the formal consent decision for a project has been given (Arts et al., 2010). Figure 3 provides an overview of the various approaches (tools, instruments or concepts) used in infrastructure planning after the consent decision as well as the parties involved and the main governance strategies. Table 1 gives a further explanation of the approaches, the parties involved and the governance strategies used.

Table 1.Main governance strategies of various instruments available at the implementation stage.

Approaches	Parties	Governance	Description and definitions
State of environ-ment monitoring	Regulator – government	Coordination	A legal requirement of governmental bodies. It aims at monitoring the ongoing state and development of the environment.
Permitting (incl. environmental requirements)	Regulator – government/ market	Coordination	An environmental permit is a document prepared by a regulator - either the Environment Agency or a local authority. It has conditions which have to be followed in order to prevent a project from harming the environment or human health.
EIA Follow-up	Regulator – government/m arket	Coordination	The monitoring and evaluation of the impacts of a project or plan (that has been subject to EIA) for management of, and communication about, the environmental performance of that project or plan (Morrison-Saunders & Arts, 2004).
Innovative contracts (DBFM, performance)	Government-market	Competition	More integrated/collaborative contracts that include the stages of planning as well as (final) designing, construction, maintenance and/or operation. The contractors bear responsibility for this. This trend can be seen in practice with the emergence of e.g. DC, DB(O)(F)M, BOT contracts. However, the relationship of these contracts with concepts as EIA follow-up and Environmental Management Systems (EMS) is usually not made. Last decades such innovative contracts have become common practice in infrastructure development in several countries – USA, UK, The Netherlands etc. (Pakkala et al., 2007;Lenferink, 2009; OECD, 2008).
Early Market Involvement	Government – market	Competition	Early contractor (or market) involvement approaches (ECI, EMI) might enlarge the scope for innovation and further integration of EIA with project design and implementation. In this approach contractors are invited to undertake also the planning and design phase of the project as well as the detailed engineering and construction. Its core is that the market party undertaking construction is also involved before the formal planning consent decision – e.g. in preparing the design and EIA. This can be done by a) preparing bids before the consent decision by competing companies of which one is awarded the final contract (as in The Netherlands) or b) it might be by even awarding the contract before the consent decision (as is in the UK) (c.f. Van Valkenburg et al., 2008; Lenferink& Arts, 2009).
Green procurement	Government – market	Competition	Green procurement is the integration of environmental considerations into purchasing policies, programmes and actions (Russel, 1998). It can be seen as process in which is strived for achieving extra environmental quality added to the normal process of procurement and contracting that already include 'standard' environmental requirements (relating to mitigation measures and meeting formal norms).In addition, green procurement and integrated contracts link well and might reinforce each other; contracts that comprise various project stages might provide good opportunities to safeguard the results of green procurement processes. Green procurement could provide for a mechanism to overcome some weaknesses of EIA by going beyond the assessment of acceptable impact and make the transition towards optimising design, construction and operation as well as addressing issues raised in the EIA process not addressed in the consent decision. Examples of green procurement in the infrastructure sector can be seen in various countries such as Canada, Sweden and The Netherlands (Nijsten et al., 2010; Varnäs et al., 2009a).

Environmental auditing and Environmental Management System (EMS)	Regulator – government/ market	Coordination/ self-coordination	An independent third party assessment of the current status of an organization's compliance with local environmental laws and regulations. Environmental Management System (EMS) – such as ISO 14.001 and EMAS – refers to an approach whereby organisations can assess and plan actions in order to minimise environmental impacts and improve environmental performance (Whitelaw,1997; Welford,1998; Steger,2000).
Sustainability rating, labelling systems: *Breeam/LEED * CEEQUAL * CO2 ladder	Government – market	Coordination	Apart from Environmental Management Systems there can be seen the development of various, additional rating systems such as Breeam, (Building Research Establishment Environmental Assessment Method), LEED (Leadership in Energy and Environmental Design) and CEEQUAL (Civil Engineering Environmental Quality Assessment & Award Scheme). Breeam is an environmental assessment method and system for buildings – although more recently there are initiatives to broaden the scope to local spatial planning projects and infrastructure projects (DGBC, 2011). It is based on a certification system and applied in housing projects but also sustainable neighbourhoods. LEED is a rating system for green buildings. CEEQUAL is an assessment and awards scheme, based on a self-assessment carried out by trained assessors (CEEQUAL, 2010; Faith-Ell &Lelie, 2011). Applied in housing and infrastructure projects (Johansson, 2011). In many countries various specific approaches have been developed such as the "CO2-Ladder" focussing on CO2 emissions and "DuBoCalc" focussing on sustainable (re)use of materials as both are applied in Dutch infrastructure sector (Zwan et al,. 2008).
Corporate Social Responsibility (CSR)	Market – government/ community	Self-coordination / cooperation	A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis (EU, 2006).
Supply Chain Management (SCM)	Market – market/ community	Self-Coordination / competition/ cooperation	Supply chain management is the management of interconnected businesses involved in the ultimate provision of product and service packages (such as infrastructure) required by end customers and focussing on creating net value for them. In relation to infrastructure some may also be combined to local content approach, which refers to involving local sub-contractors – small and medium enterprises – in the supply chain for enhancing local social-economic development.
Local content	Market – government/ community	Self-coordination / cooperation	Local content is the proportion of inputs to a product or service (e.g. materials, parts, services) that have been made in that country rather than imported (Esteves&Barclay, 2011).
Social-licence-to-operate	Market – community	Cooperation	Social licence is the level of acceptance or approval continually granted to an organisation's operations or project by local community and other stakeholders. It has four levels from lowest to highest: withdrawal, acceptance, approval and psychological identification (Boutilier&Thomson, 2009).
Community participation	Community – government/ market	Cooperation	Community Participation refers to an active process whereby beneficiaries influence direction and execution of development projects rather than merely receive a share of project benefits (Samuel, 1987).

In this paper we will discuss these emerging new approaches involving various governance – sometimes mixed – strategies between government, market and community. Not all these instruments are in the same stage of development. Some instruments are well-developed and implemented – such as environmental management systems, green procurement, others seem be broader concepts that still leave room for further elaboration in the practice of infrastructure development – e.g. Cradle-to-Cradle, Corporate social responsibility, Local content, Social license to operate. In this paper we focus especially on instruments such as innovative contracting, green procurement and environmental labelling systems as they seem to be well-developed and particularly relevant for sustainable delivery of infrastructure projects. The various approaches have developed rather separately but nevertheless seem to head in the same direction – i.e. achieving more environmental sustainable outcomes of (infrastructure) projects.

3. Tools in isolation?

The various tools and approaches discussed in the previous section have been developed individually by different bodies with different purposes (see Table1).One common denominator is that they assume new forms of governance and new partnerships – different from EIA, permitting and classic contracting – and aim at ensuring sustainable outcomes. They also relate to better linking project stages (designing, construction, operation, maintenance), tools (impact assessment, procurement, contracting) and eventual desired outcomes (environmental, economic, social). This involves more than just impact assessment. It requires looking at strategic partnerships to address (local) context issues.

Partnerships should be flexible and aimed at establishing long lasting cooperative relationships. By its nature, partnering should be a flexible process that can be adapted throughout the project cycle to ensure it remains relevant and the current needs of all the partners are met. The content of the partnerships, as well as the procedures to follow and the process must be considered. Here, partnering by cooperation with local subcontractors in the supply chain is relevant (Esteves, 2009).

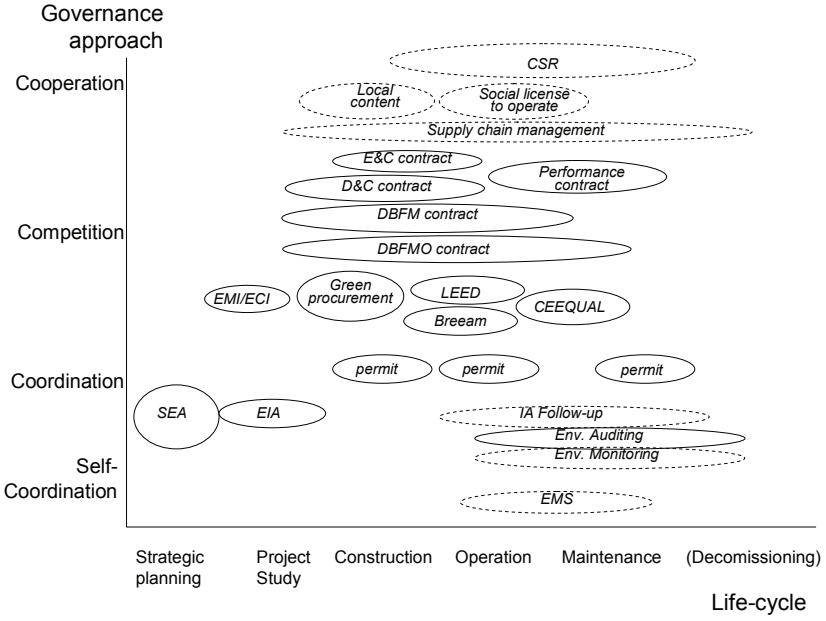

Fig. 4.Many "islands of tools".

Some of these instruments are more focussing on government (e.g. EIA follow-up, environmental auditing, state of the environment monitoring) others on community or society as a whole (e.g. local content, CSR) again others are oriented towards industry (e.g. supply chain management, EMS etc.). Some approaches are more general concepts that might provide 'inspiration' – such as C2C, CSR, Social License to Operate – other instruments (e.g. Bream, LEED, CEEQUAL, EMS and green procurement) are more business-like and include clear performance indicators.

However, many of the latter instruments are sometimes criticised of having limitations such as being too detailed and rigid. Nevertheless, many users of these instruments seem to overlook these limitations – the main reason being that the instruments are considered to fit better to implementation and better deliver sustainability than classic instruments as EIA, permitting, contracting, auditing, monitoring or EIA

Follow-up. It can be concluded that there are many instruments available in practice but that they are currently living in 'splendid isolation' – see Figure 4.

In order to improve the delivery of sustainable outcomes of infrastructure projects - plan and project approval need to be better integrated with implementation practice. This means that the available tools need to be combined. Various combinations can be based on the rich variety of instruments available (see figure 3). Moreover many different situations may occur, making tools more or less relevant. Some approaches focus on pre-decision stages (e.g. EIA), others at implementation stages (e.g. follow-up, environmental auditing) or the whole life-cycle (innovative contracts, supply chain management, C2C). One distinction that could be applied is: simple projects, large projects, complicated projects, and complex projects. Hereafter, some possible configurations of logic combinations:

- *Simple projects* – In straightforward projects in which the EIA have managed to minimise the environmental impacts and identify valid mitigation measures, traditional approaches could be applied (pre-decision, EIA, environmental permits, and classic contracts) with the addition of environmental management plans (EMPs) that would be drawn up during the consent decision-making stage. Furthermore environmental management systems could be applied, thereby linking pre- and post-decision stages more explicitly. The main advantages of using a standard EMP is the simplicity of the system, not adding complex classifications to a small project. However, significant and important environmental impacts might be overseen if the system for safeguarding environmental protection is too simple.
- *Large or complicated projects* – A higher level of complication and scale calls for more elaborated combinations of tools. For these type of projects, in addition to the traditional pre-decision EIA and environmental permitting, more innovative contracts (e.g. D&C, DBFM) could be applied. Also, additional environmental requirements relating to standardized labelling systems such as LEED, Breeam or CEEQUAL could be used together with establishing an EMP and EMS as well as careful monitoring and auditing etc. The main benefit of using sustainability rating systems is the systematic approach to implement and follow-up environmental performance that it brings to the project (Johansson, 2011). At the same time, these systems are associated with a cost. If not applied in a cautious way, these systems might lead to suboptimisation of the environmental work, focussing on the wrong aspects.
- Complex projects – In very complex projects, enhancement of sustainability could be made through addressing sustainability issues in early strategic stages (through SEA) linking them carefully to project study and EIA, and early involvement of not only the public (through participation) but of different market parties (through EMI, ECI) focussing on development of innovative solutions (Nijsten et al., 2008). The transfer of issues between pre- and post-consensus stages could be made via early and innovative contracting addressing the various stages (DBFM, alliance) adding green procurement for addressing extra ambitions that have been put forward during earlier planning stages. Also, in complex projects, other tools for sustainability delivery (CEEQUAL, C2C, Breeam) could be applied, establishing EMP and EMS with careful monitoring and auditing and enhancing partnerships between market, government and public during the life-cycle. By doing this a sufficient varied mix of governance strategies (coordination, competition and cooperation) could be created in order to enhance the capacity for innovation, learning, experimenting and adaptation to deal adequately unforeseen situations - See figure 5 for a first potential combination of tools during the planning cycle.

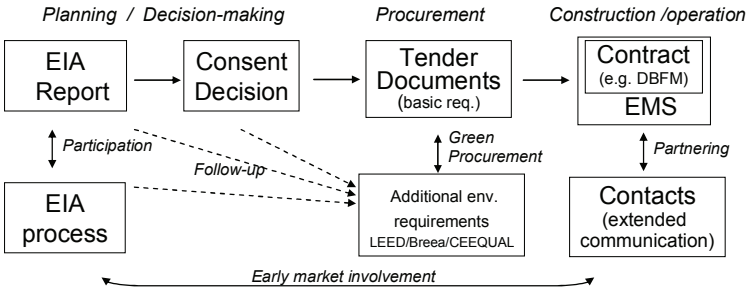

Fig. 5.Example how for complex projects the various relevant tools available might be combined in order to enhance sustainable project delivery.

4. Towards an Enhanced Sustainable Project Delivery?

Establishing partnerships brings a number of benefits to the development of infrastructure projects. It can ensure effectiveness through greater access to resources, leveraging effects and greater reach, and increase transparency and legitimacy and therefore acceptance and support for the project within local communities and amongst other stakeholders. Sharing of risks and costs can encourage greater innovation in safeguarding environmental performance. By involving other sectors in the region in project development, community dependency on a particular industry or project can be minimised. Involving communities and local NGOs is crucial in meeting ever-increasing expectations amongst affected communities for opportunities to participate in the benefits associated with projects. Partnership approaches can assist in creating a lasting heritage independent of proponents by developing local capabilities that meet the needs of projects yet are transferable and attractive to other sectors in the area. The promotion of collaboration amongst the local community, NGOs, government and service providers can also strengthen democratic processes and empowerment at the local level, a fundamental principle underlying EIA practice.

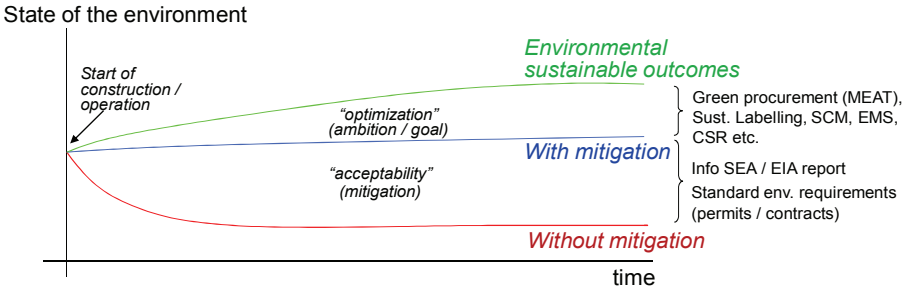

Fig. 6. The potential of pre-decision SEA/EIA and classic approaches (permitting, contracts, monitoring etc.) compared with coordinated application of new governance tools (green procurement, sustainable labelling, EMS, SCM, CSR etc.) in addition for achieving environmental sustainable outcomes.

All these concepts stress that partnerships between companies, governments, agencies and communities at different planning levels are needed to ensure responsible project-delivery. One way to do this is by using partnerships and instruments in addition to EIA for responsible project delivery over the life cycle (See Figure 6). A more sustainable outcome of a plan, programme or project can be achieved by using mutual partnerships and instruments in addition to EIA. Recent studies have showed that new, more

innovative procurement and contracting processes can help to improve the performance of EIA (Faith-Ell & Arts, 2009). Also, Varnäs et al. (2009b) indicate a need to understand the scope for improving the coordination between green procurement and EIA in order to initiate discussions on and planning for green procurement at the EIA stage itself. On the other hand, EIA can provide information and scope issues that are relevant for green procurement and partnering contracts, thereby strengthening environmental outcomes of infrastructure projects.

However, in order to apply partnerships for enhanced sustainable project delivery two forms of linkages can be seen regarding integration (Lenferink et al 2008, see Figure 7):

- Directive management, forward integration: relating to the role of strategic plans and project studies related to consent decisions about infrastructure in giving direction to subsequent process;
- Inclusive partnerships, backward integration: relating to the importance of being inclusive of other tools used in implementation stages in the earlier planning stages (strategic and project assessment and consent decision-making).

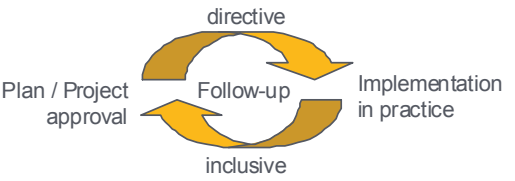

Fig. 7.Forward and backward linkages in infrastructure planning.

First of all, infrastructure planners need to expand their scope by addressing not only the plan and project development stages and related to that SEA and EIA. Infrastructure planning should address the whole life-cycle all the way to construction and operation as well as the rich and broad array of instruments also focussing on sustainable performance available at the follow-up stages (see Figure 3). In order to be more effective in delivering commitments made during planning and decision making and in achieving sustainable performance throughout the whole life-cycle, infrastructure planning and impact assessment should not only give direction to subsequent IA studies but also to the other relevant instruments available.

Secondly, in order to link up effectively with these tools and instruments in the follow-up this requires adaptation to the new governance arrangements implied by those instruments (see Figure 3). As discussed, many of these instruments imply partnerships between various parties and they assume not only hierarchic, directive steering (coordination) but also exploiting network steering and market steering mechanisms (cooperation and competition). This implies that there is need for partnerships with other than the traditional parties in earlier planning stages. This means that infrastructure planning has to engage in other approaches and the parties involved in them (outside – in).

This issue of partnerships proves to be important as contracts will relate to more inclusive scope of issues (not only substantive, technical project issues, but also social, process, context-related elements) as well as to longer time periods (sometimes 30 years or even more), there is need for more flexibility in contract requirements. In traditional contracting rather detailed requirements have been used. However in order to deal with dynamics and complexity over a long time period not only clear ‘contracts’ but also open ‘contacts’ are important (Faith-Ell & Arts, 2009; Van Valkenburg et al., 2008). Partnerships should be flexible and aimed at establishing long lasting cooperative relationships in order to allow for sufficient adaptive capacity to react to changing circumstances.

5. Discussion and conclusions

On basis of the previous discussion above, a transition from traditional contracting arrangements towards more green procurement processes and collaborative relationships can be seen in the planning of infrastructure. This can and will influence the practice of how sustainability will be integrated in future infrastructure planning.

First of all, these new approaches provide an opportunity to further environmental performance of infrastructure projects beyond compliance with regulations towards sustainable development. Recent studies have showed that new, more innovative procurement and contracting processes can help to improve the performance of EIA (Faith-Ell & Arts, 2009).

By integrating green procurement, partnership approaches and sustainability declaration, an integrated approach could be developed in order to safeguard sustainable performance beyond the formal decision-making phase of infrastructure projects. This integrated approach would imply establishing partnerships and new mixes of governance. By this it might enable transfer of information, communication, learning from experience and adaptive environmental management needed to deal with sustainability issues in complex contexts.

However, in order to achieve delivery of sustainable outcomes there is a need for better coordination of these tools. This coordination can only be achieved if infrastructure planning is inclusive of other instruments than EIA already in earlier planning stages. Thereby it gives direction to subsequent processes and tools. Also, the coordination and combination of different tools will differ depending on project complexity. There is a need to utilise an array of tools in complex projects while more simple projects can rely on a more traditional approach based on EIA, EIA follow-up and Environmental Management Plans.

By integrating green procurement, partnering and sustainability declaration, an integrated approach could be developed in order to safeguard sustainable performance beyond the formal decision-making phase of infrastructure projects. This integrated approach would enable transfer of information, communication, learning from experience and adaptive environmental management thereby furthering new governance approaches for sustainable project delivery.

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